

APPENDIX A (1)

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ProcInsFile { type "Dataset Transforms" ver "4.1.03" date
gitransform { name "!Unit3_down!" expr "Sif(!AL3IG03A! < 75, 1.0, 0.0) ; if the unit is down then application goes
away." }
gitransform { name "!mw_o2_limit!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_o2_limit", !AL3IG03A!), 1,
SFILTER_FREEZE) ; read in tuneable parameters" }
gitransform { name "!mw_exit_gas_max!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_exit_gas_max", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_sh_mill_min_limit!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_sh_mill_min_limit", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_rh_mill_min_limit!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_rh_mill_min_limit", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_sh_mill_out_desired!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_sh_mill_out_desired", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_rh_mill_out_desired!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_rh_mill_out_desired", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_wb_fur_max!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_wb_fur_max", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_sh_ccofa_min!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_sh_ccofa_min", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_rh_ccofa_min!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_rh_ccofa_min", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_sh_stm_limit!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_sh_stm_limit", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_GAM_check_generation_limit!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_GAM_check_generation_limit", !AL3IG0
3A!), 1, SFILTER_FREEZE) }
gitransform { name "!mw_sh_stm_time_filter!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_sh_stm_time_filter", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_fuz_diff!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_fuz_diff", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!mw_nox_time_filter!" expr
"SEXPave(Sreadparam("c:\duke\mw_max\max_mw_tune.params", "mw_nox_time_filter", !AL3IG03A!), 1,
SFILTER_FREEZE) }
gitransform { name "!3sa_up!" expr "Sif(!FT3FH00! >= 2.8, 1.0, 0.0) ; scan to see which feeders are up" }
gitransform { name "!3sb_up!" expr "Sif(!FT3FH06! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3sc_up!" expr "Sif(!FT3FH12! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3sd_up!" expr "Sif(!FT3FH18! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3ra_up!" expr "Sif(!FT3FH03! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3rb_up!" expr "Sif(!FT3FH09! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3rc_up!" expr "Sif(!FT3FH15! >= 2.8, 1.0, 0.0) " }
gitransform { name "!3rd_up!" expr "Sif(!FT3FH21! >= 2.8, 1.0, 0.0) " }
gitransform { name "!s_fdsr_up!" expr "!3sa_up! + !3sb_up! + !3sc_up! + !3sd_up! ; perform a few calculations needed
by the logic" }
gitransform { name "!r_fdsr_up!" expr "!3ra_up! + !3rb_up! + !3rc_up! + !3rd_up!" }
gitransform { name "!Exit_gas_temp!" expr "(!AM3FH91E! + !AM3FH86E! + !AM3FH81E!) / 3 ; below we begin the
logic scans to surface and remove bottlenecks to MW production" }
gitransform { name "!Max_O2_limit_high_condition!" expr "Sif(!O031X095! > !mw_o2_limit!, Sif(!DC3AJ04C! >
0.5, 1.0, 0.0) , 0.0) ; If true, the O2 setpoint is higher than necessary for max mw. recommend lower O2 sp." }
gitransform { name "!High_exit_gas_temp_condition!" expr "Sif(!Exit_gas_temp! > !mw_exit_gas_max!, 1.0, 0.0) ; If
true then the exit gas temp is getting high, recommend IK Blowers and Preheat Sootblower use" }

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APPENDIX A (2)

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gtransform { name "!Positive_SA_mill_press_condition!" expr " Sif(!PT3FH149! >= 0.0, Sif(!3sa_up! > 0.5,
Sif(!TE3FH48! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true SA mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_SB_mill_press_condition!" expr " Sif(!PT3FH30B! >= 0.0, Sif(!3sb_up! > 0.5,
Sif(!TE3FH54! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true SB mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_SC_mill_press_condition!" expr " Sif(!PT3FH36B! >= 0.0, Sif(!3sc_up! > 0.5,
Sif(!TE3FH60! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true SC mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_SD_mill_press_condition!" expr " Sif(!PT3FH42B! >= 0.0, Sif(!3sd_up! > 0.5,
Sif(!TE3FH66! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true SD mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_RA_mill_press_condition!" expr " Sif(!PT3FH27B! >= 0.0, Sif(!3ra_up! > 0.5,
Sif(!TE3FH51! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true RA mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_RB_mill_press_condition!" expr " Sif(!PT3FH33B! >= 0.0, Sif(!3rb_up! > 0.5,
Sif(!TE3FH57! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true RB mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_RC_mill_press_condition!" expr " Sif(!PT3FH39B! >= 0.0, Sif(!3rc_up! > 0.5,
Sif(!TE3FH63! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true RC mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!Positive_RD_mill_press_condition!" expr " Sif(!PT3FH45B! >= 0.0, Sif(!3rd_up! > 0.5,
Sif(!TE3FH69! > !mw_sh_mill_min_limit!, 1.0, 0.0) , 0.0), 0.0) ; if true RD mill is going positive, recomend lowering
mill temp set point" }
gtransform { name "!4Mill_SH_temp_low_condition!" expr " Sif(!s_fds_up! > 3.0, Sif(!TE3FH48! <
!mw_sh_mill_out_desired!) Sor (!TE3FH54! < !mw_sh_mill_out_desired!) Sor (!TE3FH60! <
!mw_sh_mill_out_desired!) Sor (!TE3FH66! < !mw_sh_mill_out_desired!) , 1.0, 0.0) , 0.0) ; If true then one or more
SH mill temp is too low for 4 mill operaiton, recommend increase to desired" }
gtransform { name "!4Mill_RH_temp_low_condition!" expr " Sif(!r_fds_up! > 3.0, Sif(!TE3FH51! <
!mw_sh_mill_out_desired!) Sor (!TE3FH57! < !mw_sh_mill_out_desired!) Sor (!TE3FH63! <
!mw_sh_mill_out_desired!) Sor (!TE3FH69! < !mw_sh_mill_out_desired!) , 1.0, 0.0) , 0.0) ; If true then one or more
RH mill temp is too low for 4 mill operaiton, recommend increase to desired" }
gtransform { name "!Wind_box_restriction_condition!" expr " Sif(!O038X854! > !mw_wb_fur_max!) Sand
(!DC3A104A! < 0.5) Sand (!DC3A104C! > 0.5) , 1.0, 0.0) ; if true then wind box restrictions exist, and recommend
reduce fur/wb max by 0.2" }
gtransform { name "!SA_CCOFA_restriction_condition!" expr " Sif(!PZ3FH10! < !mw_sh_ccofa_min!) Sor
(!PZ3FH11! < !mw_sh_ccofa_min!) , 1.0, 0.0) ; if true then CCOFA restrictions exist, and recommend reduce NOX set
point" }
gtransform { name "!RA_CCOFA_restriction_condition!" expr " Sif(!PZ3FH12! < !mw_rh_ccofa_min!) Sor
(!PZ3FH13! < !mw_rh_ccofa_min!) , 1.0, 0.0) ; if true then CCOFA restrictions exist, and recommend reduce NOX set
point" }
gtransform { name "!CCOFA_restriction_condition!" expr " Sif(!SA_CCOFA_restriction_condition! > 0.5 Sor
!RA_CCOFA_restriction_condition! > 0.5, 1.0, 0.0) ; accumulated CCOFA restricion scan" }
gtransform { name "!add_load_condition!" expr " Sif(!Max_O2_limit_high_condition! +
!High_exit_gas_temp_condition! + !Positive_SA_mill_press_condition! + !Positive_SB_mill_press_condition! +
!Positive_SC_mill_press_condition! + !Positive_SD_mill_press_condition! + !Positive_RA_mill_press_condition! +
!Positive_RB_mill_press_condition! + !Positive_RC_mill_press_condition! + !Positive_RD_mill_press_condition! +
!4Mill_SH_temp_low_condition! + !4Mill_RH_temp_low_condition! + !Wind_box_restriction_condition! +
!SA_CCOFA_restriction_condition! + !RA_CCOFA_restriction_condition! + !CCOFA_restriction_condition!) < 0.5
Sand !DC3A104C! < 0.5, 1.0, 0.0) ; If no alrams exist, and not O2 blocking incease, then add load" }
gtransform { name "!GP3A101A!" expr " 0.0 + ( Sif(Svalid(!Max_O2_limit_high_condition!) ,
Sif(!Max_O2_limit_high_condition! > 0.5, 1.0, 0.0) , 0.0) ) + ( Sif(Svalid(!High_exit_gas_temp_condition!) ,
Sif(!High_exit_gas_temp_condition! > 0.5, 2.0, 0.0) , 0.0) ) + ( Sif(Svalid(!Positive_SA_mill_press_condition!) ,
Sif(!Positive_SA_mill_press_condition! > 0.5, 4.0, 0.0) , 0.0) ) + ( Sif(Svalid(!Positive_SB_mill_press_condition!) ,
Sif(!Positive_SB_mill_press_condition! > 0.5, 8.0, 0.0) , 0.0) ) " }
gtransform { name "!GP3A101A!" expr " !GP3A101A! + ( Sif(Svalid(!Positive_SC_mill_press_condition!) ,
Sif(!Positive_SC_mill_press_condition! > 0.5, 16.0, 0.0) , 0.0) ) + ( Sif(Svalid(!Positive_SD_mill_press_condition!) ,
Sif(!Positive_SD_mill_press_condition! > 0.5, 32.0, 0.0) , 0.0) ) " }
gtransform { name "!GP3A101A!" expr " !GP3A101A! + ( Sif(Svalid(!Positive_RA_mill_press_condition!) ,
Sif(!Positive_RA_mill_press_condition! > 0.5, 64.0, 0.0) , 0.0) ) + ( Sif(Svalid(!Positive_RB_mill_press_condition!) ,
Sif(!Positive_RB_mill_press_condition! > 0.5, 128.0, 0.0) , 0.0) ) " }

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APPENDIX A (3)

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gtransform { name "!GP3AI01A!" expr "!GP3AI01A! + ( Sif(Svalid(!Positive_RC_mill_press_condition!) ,
Sif(!Positive_RC_mill_press_condition! > 0.5, 256.0, 0.0) , 0.0) ) + (Sif(Svalid(!Positive_RD_mill_press_condition!) ,
Sif(!Positive_RD_mill_press_condition! > 0.5, 512.0, 0.0) , 0.0) ) " }
gtransform { name "!GP3AI01A!" expr "!GP3AI01A! + ( Sif(Svalid(!4Mill_SH_temp_low_condition!) ,
Sif(!4Mill_SH_temp_low_condition! > 0.5, 1024.0, 0.0) , 0.0) ) + (Sif(Svalid(!4Mill_RH_temp_low_condition!) ,
Sif(!4Mill_RH_temp_low_condition! > 0.5, 2048.0, 0.0) , 0.0) ) " }
gtransform { name "!GP3AI01A!" expr "!GP3AI01A! + ( Sif(Svalid(!Wind_box_restriction_condition!) ,
Sif(!Wind_box_restriction_condition! > 0.5, 4096.0, 0.0) , 0.0) ) + (Sif(Svalid(!CCOFA_restriction_condition!) ,
Sif(!CCOFA_restriction_condition! > 0.5, 8192, 0.0) , 0.0) ) ; here we are building the word to pass back to the
operator display" }
gtransform { name "!GP3AI01A!" expr "!GP3AI01A! + ( Sif(Svalid(!add_load_condition!) , Sif(!add_load_condition!
> 0.5, 16384.0, 0.0) , 0.0) ) " }
gtransform { name "!avg_sh_fdr_spd!" expr "(!FT3FH00! + !FT3FH06! + !FT3FH12! + !FT3FH18!) / !s_fdrs_up! }
gtransform { name "!avg_rh_fdr_spd!" expr "(!FT3FH03! + !FT3FH09! + !FT3FH15! + !FT3FH21!) / !r_fdrs_up! " }
gtransform { name "!Avg_sh_stm_temp!" expr "SExpAve(((AL3BC56A! + !AL3BC56B!) / 2) ,
!mw_sh_stm_time_filter!, SFILTER_FREEZE) " }
gtransform { name "!Steam_temp_too_low_condition!" expr " Sif(((AL3IG03A! >=
!mw_GAM_check_generation_limit!) Sand (!DC3AI03D! > 0.5) Sand (!Avg_sh_stm_temp! < !mw_sh_stm_limit!) ,
1.0, 0.0) ; If the unit is at highrates, and is ready for optimization, and the sh steam temp is low, then recommend GAM
addition" }

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Atty. Dkt. No.: PAVI-26,575

Point ID	BIT	Constants	Logic	Condition	Advice
GP3A101A	0	mw_o2_limit = 2.5	O2 > mw_o2_limit and ID Fan Dlocking Increase	O2 is higher than necessary for Maximizing Load	reduce Max O2 limit by 0.1
	1	mw_exit_gas_max = 290	Exit_Gas_Temp > mw_exit_gas_max Exit_Gas_Temp = (AM3FH91E + AM3FH10E) + AM3FH101E/3	Exit Gas Temperature to high	Lower the IK flowmeters and the Preheater Sootblowers
	2	mw_sh_mill_min_limit = 160	SA Mill Press > 0.0 & > mw_sh_mill_min_limit	SA Mill going positive	Reduce SA Mill Temp Target 2 deg F
	3		SD Mill Press > 0.0 & > mw_sh_mill_min_limit	SD Mill going positive	Reduce SD Mill Temp Target 2 deg F
	4		SC Mill Press > 0.0 & > mw_sh_mill_min_limit	SC Mill going positive	Reduce SC Mill Temp Target 2 deg F
	5		SO Mill Press > 0.0 & > mw_sh_mill_min_limit	SO Mill going positive	Reduce SO Mill Temp Target 2 deg F
	6	mw_rh_mill_min_limit = 160	RA Mill Press > 0.0 & > mw_rh_mill_min_limit	RA Mill going positive	Reduce RA Mill Temp Target 2 deg F
	7		RD Mill Press > 0.0 & > mw_rh_mill_min_limit	RD Mill going positive	Reduce RD Mill Temp Target 2 deg F
	8		RC Mill Press > 0.0 & > mw_rh_mill_min_limit	RC Mill going positive	Reduce RC Mill Temp Target 2 deg F
	9		RD Mill Press > 0.0 & > mw_rh_mill_min_limit	RD Mill going positive	Reduce RD Mill Temp Target 2 deg F
	10	mw_sh_mill_out_desired = 180	SH Mill_Out_Temp < mw_sh_mill_out_desired AND 4 SH Mill operation	4 SH Mill Temperature to low	raise temperature setpoint to 180
	11	mw_rh_mill_out_desired = 180	Mill_Out_Temp < Mill_Out and 4 RH Mill operation	4 RH Mill Temperature to low	Raise temperature setpoint to 180 for all RH Mills
	12	mw_wb_fur_max = 2.5	WD/Fur > mw_wb_fur_max and wb_min block not on & ID Fan Dlocking Increase	wind box restrictions exist	reduce fur/wb max by 0.2
	13	mw_sh_ccola_min = 70 mw_rh_ccola_min = 70	SH or RH CCOFAs < mw_ccola_min & ID Fan Dlocking Increase	CCOFAs restricting flow	Lower NOx Target by 0.02
	14		bits 0-13 are clear & ID fans not blocking Increase	Load can be added	Add Load
GP3A101B	0		Model Optimizer avg SH_fdr_speed > max fdr speed avg RH_fdr_speed > max fdr speed	Feeder bias detected	Increase Max Fdr Speed Above the avg_sh_fdr_spt and avg_rh_fdr_spt
	1	mw_sh_stm_limit = 1050 mw_GAM_check_generation_limit = 200 mw_sh_stm_time_filter = 0.00033 (1)	Once the Unit Is Ready for Optimization, and While MW > mw_GAM_check_generation_limit IF time_filtered avg SH_Temp < mw_sh_stm_limit	Steam Temps too low	Consider GAM usage
	2		O2 Min > O2 Max	Infeasible O2 Constraints	Increase O2 Max = O2 Min
	3		FDR spd MIN > FDR spd MAX	Infeasible FDR constraints	Increase FDR spd Max or decrease FDR spd Min
	4		WD/Furn Min > WD/Furn Max	Infeasible WD/Furn Constraints	Increase WD/Furn Max = WD/Furn Min